

Work Order ID 69971

Wednesday, May 25, 2011 9:07:38 AM



Page 1

Item ID: D206-667-207BL

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Mid Aft

Start Date: 5/25/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 6/30/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan: *P*

Date: *11/05/11* Tooling:

Date:

QC:

Date: SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

IIN-D206-667

D

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D206-667-207

*CHG 602
★ SEE ATTACHED*

Sullosky

Debar CL 11-7-14

110

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D206-667-247 using CNC bender program D206-667-207

DP

11-7-4

120

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

Sullosky

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng/ Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 69971

Wednesday, May 25, 2011 9:07:39 AM



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Item ID: D206-667-207BL

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Setup Start



Revision ID:

Stop



Item Name: Crosstube Mid Aft

Start Date: 5/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 6/30/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

0.00



Crosstubes

Crosstubes

Memo

0.00

1-Drill pilot holes in tube using drill Jig DT 8583 & DT 8584 and drill table DT8577 and tower holes #6 as per QSI0010 and as per Dwg D206-667-247. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT 8583 & DT 8584 as per Dwg D206-667-247 Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT 8583 & DT 8584 as per Dwg D206-667-247. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT & DT as per Dwg D206-667-247

6-Drill Fwd rivet holes using drill Jig DT 8787 as per Dwg D206-667-147. Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT 8788 as per Dwg D206-667-247.

8-C'sink holes as per Dwg D206-667-247.

9-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-247 Inside of Cuff (Do not engrave on outside of tube)

10-Deburr & Inspect for surface damage. Repair damage within limits as per

JW
SAD
11-07-05

JW 11-07-05

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Required Date: 6/30/2011 Req'd Qty: 1.00

Reference:

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Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Dwg
D206-667-247

140



HandFXtube

Hand Finishing Crosstubes

Crosstubes Chemical Conversion

0.00

SAD 11-07-07

Memo

0.00

150



QC

Quality Control

QC3- Inspect Part Finish

0.00

S u l o r l o r

Memo

0.00

160



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

S u l o r l o r

Memo

0.00

FD

W/O:		WORK ORDER CHANGES					
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Required Date: 6/30/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200		0.00							
	SprayPaint								
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME: Start Time: _____ Finish Time: _____								
	PAINT: Start Time: _____ Finish Time: _____								
	Prime: 117319 Paint: 115985 Clear: 117113								
210	QC14- Inspect Spray Paint	0.00							
QC	Memo	0.00							
Quality Control	Wrap in plastic bag to protect from scratches								

W 11 07 11 (1)

AT 11-07-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Start Date: 5/25/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 6/30/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

220

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Install nut plates as per Dwg D206-667-247.

85 11-07-13

230

0.00



Skidtubes

Crosstubes

Memo

0.00

Crosstubes

1-Install support using 0.03" to 0.06" thick layer of magnobond 6398 per QSI 015. Let cure for 12h after installation and prior to packaging. Note: (3) top holes should be facing up.

A/R Magnobond 6398:

118234

Pro seal

2-Install supports and clamps as per Dwg D206-667-247. Torque clamps to 80-100 in lb

*USE PROSEAL
SEE ATTACHED

85 11-07-13

P70

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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W/O: 69971		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.07.06	230	BOND SUPPORTS USING PROSEAL PER ATTACHED PROCEDURE (EMAIL) NEW CHG 002	See Spec 230		1	CP 11.07.06 DS/642	S M/415

Part No: D206-667-207BL PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Wednesday, June 15, 2011 3:05 PM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'; 'Linda Lacelle'
Subject: RE: Procedure for installing supports.

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Chris,

I agree with your procedure outlined below. It is our preference to leave the paint on the crosstube if we can for added corrosion protection (and for ease of manufacture). If Dan's final testing shows there is a big difference between a painted/unpainted crosstube, then we will switch to alodine only on the crosstube.

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]
Sent: Wednesday, June 15, 2011 11:24 AM
To: 'David Shepherd'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'
Subject: RE: Procedure for installing supports.

David,

Can I confirm that this is the agreed procedure for all newly manufactured tubes with off-center supports:

- Scuff paint under support, clean with MEK
- Completely remove any finish on support (if present), scuff bottom surface of support, clean with MEK
- Apply a 0.04" – 0.07" layer of Proseal 890 class B-2 on bottom of support and install wet.
- Install clamps and torque per dwg
- Clean up excess proseal
- Let cure for 72 hours after installation, recheck torque.

Chris

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: Tuesday, June 14, 2011 10:59 AM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'
Subject: RE: Procedure for installing supports.

Made a couple of small changes.

- Remove finish on xtube in area of support down to alodine finish.
- Touch up alodine on xtube in affected area
- Completely remove any finish on support, scuff bottom surface of support
- Apply a 0.04" – 0.07" layer of Proseal 890 class B-2 on bottom of support and install wet.
- Install clamps and torque per dwg

Work Order ID 69971

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Required Date: 6/30/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00				<u>11</u>	<u>11</u>	<u>07</u>	<u>14</u>
250 Packaging Packaging	Pick Kit Memo	0.00 0.00							<u>11</u> <u>7/14</u>
260 QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00							<u>11</u> <u>7/14</u>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID 69971

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270	Packaging	0.00							
	Packaging								
Packaging	Memo	0.00							
	Identify and pack for shipping as per PPP D206-667-207								
	Location: _____								
	PPP Rev: <u>DRAFT</u>								
280	QC21- Final Inspection - Work Order Release	0.00							
	QC								
Quality Control	Memo	0.00							

11/12/14

11/7/14

MF
11-07-14

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Wednesday, May 25, 2011 9:07:45 AM

Page 1

Work Order ID: 69971

Parent Item: D206-667-207BL

Parent Item Name: Crosstube Mid Aft

Start Date: 5/25/2011

Required Date: 6/30/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: RevA 11.01.13 New Issue EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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AN5-10A Bolt		Purchased	No				Each	304.0000		10		37	
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Location	Loc Qty	Loc Code
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ST337	304	
117313	179	
117795	125	

AN5-32A Bolt		Purchased	No				Each	176.0000					
-----------------	--	-----------	----	--	--	--	------	----------	--	--	--	--	--

Location	Loc Qty	Loc Code
----------	---------	----------

ST340	176	
115589	51	
117161	50	
117514	50	
117688	25	

AN5-34A Bolt		Purchased	No				Each	130.0000		4			
-----------------	--	-----------	----	--	--	--	------	----------	--	---	--	--	--

Location	Loc Qty	Loc Code
----------	---------	----------

ST340	130	
116704	20	
117010	20	
117366	20	
117794	70	

AN960JD516 Washer	NAS1149D0563J	Purchased	No				Each	0.0000		18			
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Wednesday, May 25, 2011 9:07:45 AM

Work Order ID: 69971

Parent Item: D206-667-207BL

Parent Item Name: Crosstube Mid Aft

Start Date: 5/25/2011

Required Date: 6/30/2011

Start Qty: 1.00

Required Qty: 1.00

D206-667-247TRN Manufactured No

Each 0.0000



B69979



1
① DP 11-7-4

Crosstube Assembly, Mid Aft

D2873-043 Manufactured No

Each 40.0000



2
BT 11-07-13

Nut Plate Assembly

Location	Loc Qty	Loc Code
LG	36	
68084	16	
68801	20	
LG052	4	
66898	4	

x2

D2873-045 Manufactured No

Each 35.0000



71307



2
BT 11-07-13

Nut Plate Assembly

Location	Loc Qty	Loc Code
LG	20	
68800	20	
LG052	15	
65992	5	
67741	10	

D2892-1 Manufactured No

Each 18.0000



B 70735



2
BT 11-07-13

Support

Location	Loc Qty	Loc Code
LG052	18	
42785	14	
62592	2	
65717	2	

W/O:		WORK ORDER CHANGES					
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Picklist Print

Wednesday, May 25, 2011 9:07:46 AM

Work Order ID: 69971

Parent Item: D206-667-207BL

Parent Item Name: Crosstube Mid Aft

Start Date: 5/25/2011

Required Date: 6/30/2011

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured

No

Each

61.5400

4



RUBBER CUSHION

70113



85 11-07-13

Location

Loc Qty

Loc Code

LG

52

67353

7

68893

45

LG055

9.54

68157

9.54

Each

200.0000

14

MS20601-AD4W10

Purchased

No



RIVET



85 11-07-13

Location

Loc Qty

Loc Code

LG051

200

116186

3

116767

14

117193

83

117676

100

Each

1,243.000

4

MS21042L5

Purchased

No



Nut



X 14
11/21/14 SD

Location

Loc Qty

Loc Code

ST300

1243

116105

283

116548

260

117441

500

117591

100

117611

100

W/O:		WORK ORDER CHANGES					
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Parent Item Name: Crosstube Mid Aft

Start Date: 5/25/2011

Required Date: 6/30/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-22

Purchased

No

Each

95.0000

4



Clamp(per MIL-DTL-8783C)

BT 11-07-13

Location

Loc Qty

Loc Code

LG050

95

116207

7

117279

38

117506

50

X 8
2

Wednesday, May 25, 2011 9:07:46 AM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

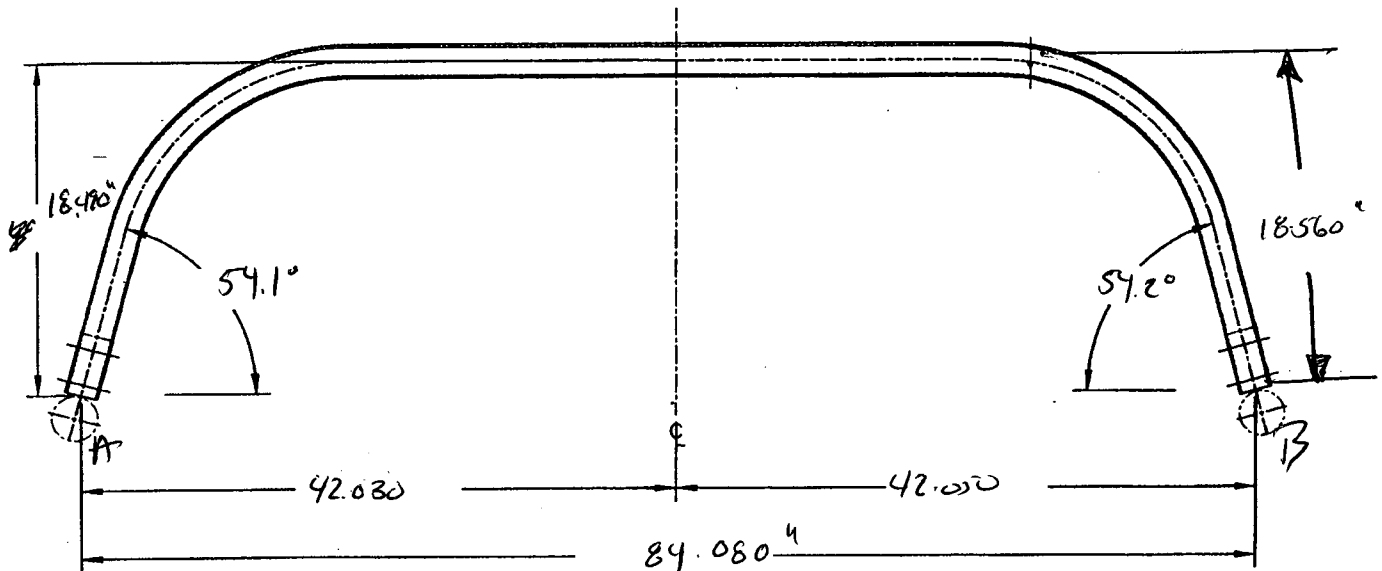
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DART AEROSPACE LTD	Work Order: 69971
Description: Cross tube	Part Number: D206-667-247
Inspection Dwg: D206-667-247 Rev: A	Page 1 of 1

Required Dimension	Min	Max
Height 18.47	18.340"	18.600"
1/2 Span 41.52	41.770"	42.050"
Angle 54.1	54	56
Total Span 83.04	83.580"	84.100"



Comments

QC15 Inspection	8
Date	6/10/05

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	



Item	Qty -247	Part Number	Description
1	X	D206-667-247	CROSSTUBE ASSEMBLY (206L MID AFT)
2	1	D6004-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2892-1	SUPPORT
6	4	D3595-063-450	RUBBER CUSHION
7	4	MS21920-22	CLAMP
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6004-115
FINISHED LENGTH = 99.76±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER 'D206-667-247' AND BATCH NUMBER ON
INSIDE OF CLIFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 21.1 lbs (-607 = 17.7 lbs)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI
015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE
D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE
LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOW COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 69971

11-05-25

RELEASED
2011-05-25
IND

A	NEW ISSUE	CP	10.12.23
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>P</i>		
DRAWN	<i>q</i>		
CHECKED	<i>E</i>		
MFG. APPR.	<i>E</i>		
APPROVED	<i>W</i>		
DE APPR.	<i>W</i>		
DATE	10.12.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D206-667-247	REV. A SHEET 1 OF 4
TITLE CROSSTUBE ASSY (206L MID AFT)	SCALE NTS

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

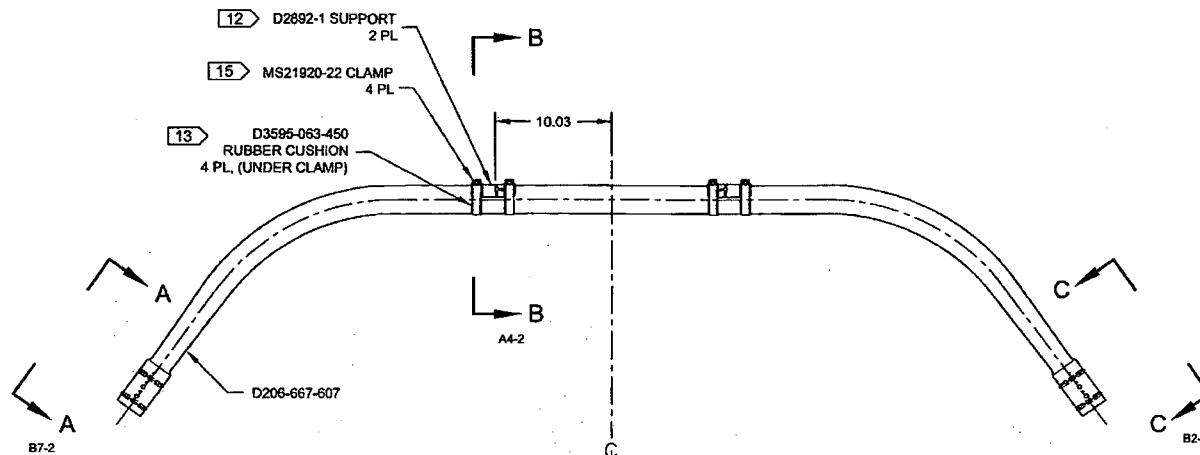
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

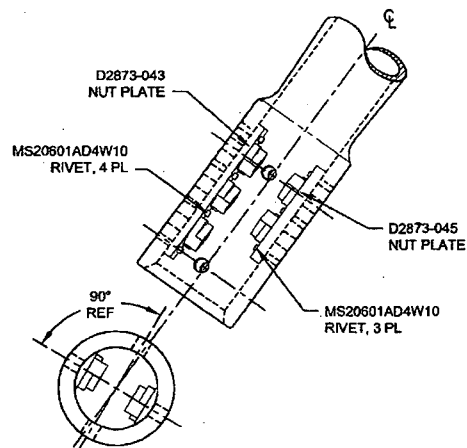
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

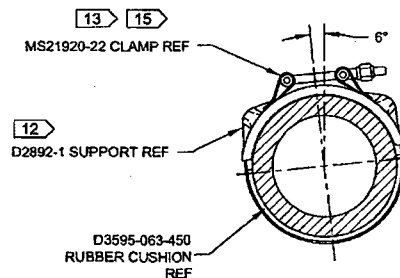
8 7 6 5 4 3 2 1



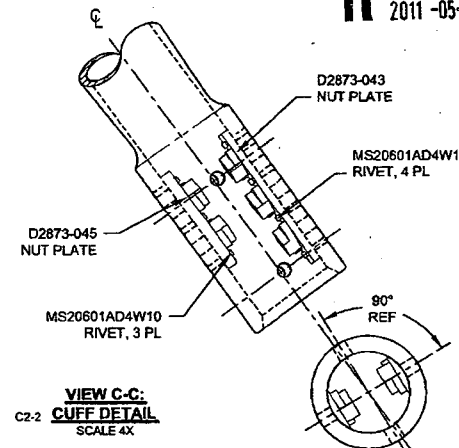
D206-667-247
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



VIEW A-A:
CUFF DETAIL
SCALE 4X



SECTION B-B
SCALE 5X



VIEW C-C:
CUFF DETAIL
SCALE 4X

DESIGN	40	DART AEROSPACE LTD	
DRAWN	49	HAWKESBURY, ONTARIO, CANADA	
CHECKED	5	DRAWING NO.	REV. A
MFG. APPR.	5	D206-667-247	SHEET 2 OF 4
APPROVED	5	TITLE	SCALE
DE APPR.	#	CROSSTUBE ASS'Y (206L MID AFT)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSES, OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

RELEASED
2011-05-24

8 7 6 5 4 3 2 1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

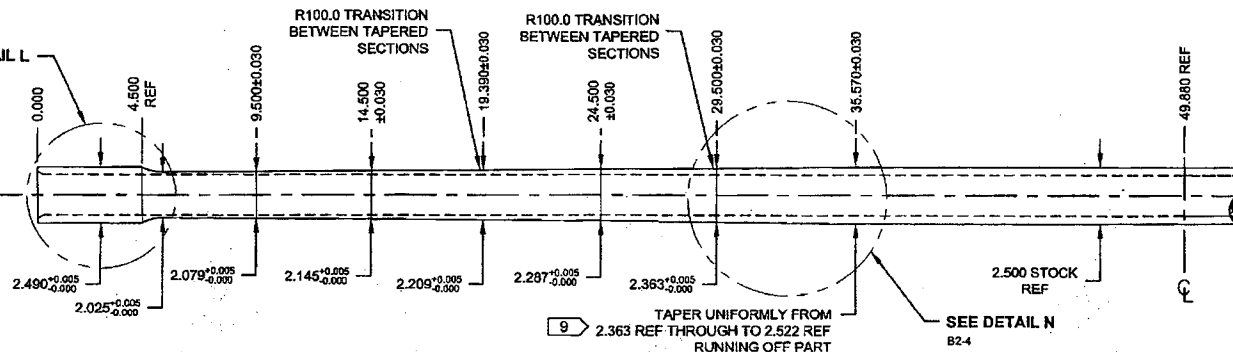
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

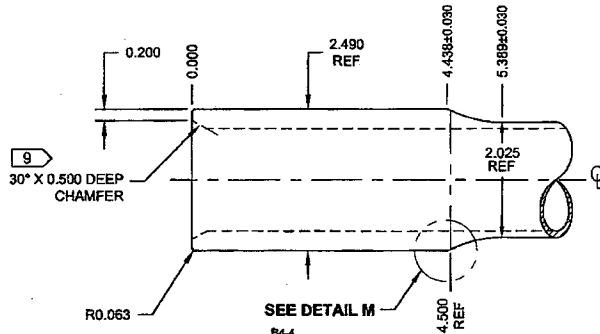
NOTE: Date & initial all entries

8 7 6 5 4 3 2 1

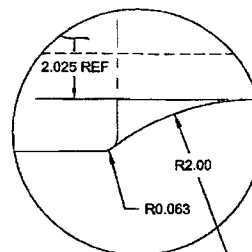
SEE DETAIL L
B7-4



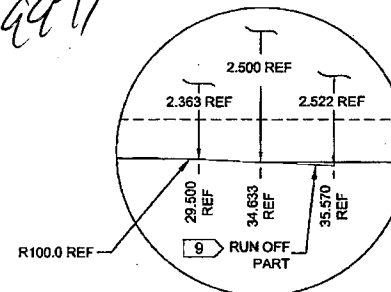
TURNING DETAIL



C7-4 **DETAIL L: CROSSTUBE CUFF**
SCALE 2.5X



B5-4 **DETAIL M: CUFF TRANSITION**
NOT TO SCALE



C4-4 **DETAIL N: TAPER RUN-OFF**
NOT TO SCALE

RELEASED
2011-05-26

DESIGN	90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	91		
CHECKED	92	DRAWING NO.	REV. A
MFG. APPR.	93	D206-667-247	SHEET 4 OF 4
APPROVED	94	TITLE	SCALE
DE APPR.	95	CROSSTUBE ASS'Y (206L MID AFT)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR FOR ANY DISSEMINATION TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

5.2 MID-HEIGHT CROSSTUBES

Item	Qty -107	Qty -207	Part Number	Description
	X		D206-667-107	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 MID FWD
		X	D206-667-207	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 MID AFT
7	1		D206-667-147	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 MID FWD
8		1	D206-667-247	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 MID AFT
10	*2		D2891-1	SUPPORT
11		*2	D2892-1	SUPPORT
13	*4		D3595-063-395	RUBBER CUSHION
14		*4	D3595-063-450	RUBBER CUSHION
16	*4		MS21920-20	CLAMP
17		*4	MS21920-22	CLAMP
19	4		AN5-32A	BOLT
20		*4	AN5-34A	BOLT
21	4	*4	MS21042L5	NUT (OR MS21042-5)
22	8	8	NAS1149C0563J	WASHER (OR AN950JD516)
40	*2	*2	D2873-043	NUT PLATE
41	*2	*2	D2873-045	NUT PLATE
44	10		AN5-7A	BOLT
45		10	AN5-10A	BOLT
46	4		AN5-30A	BOLT
47		4	AN5-32A	BOLT
48	12		AN970-4	WASHER (OPTIONAL)
50	10	10	NAS1149C0563J	WASHER (OR AN960JD516)

*REFERENCE ONLY. PARTS ARE INCLUDED IN D206-667-147/-247 ASSEMBLIES ABOVE



ACUREN

LIQUID PENETRANT TEST REPORT

P-05622

PAGE 1 OF 1

CLIENT

ATTENTION

ADDRESS

PROJECT

ITEM(S) EXAMINED

DATE

ACUREN JOB NO.

PO/NO.

WORK LOCATION

ACCEPTANCE STD.

TIME

AM

PM

REV./DATE

JOB DESCRIPTION

PROCEDURE NO. LT-000

REV./DATE

TECHNIQUE NO. LT-000

REV./DATE

ART NO.

MATERIAL

THICKNESS

SCOPE

TEST DETAILS

METHOD

☒ FLUORESCENT☐ VISIBLE☒ WATER WASH☐ SOLVENT REMOVABLE☐ POST EMULSIFIED

FAMILY BRAND

BLACK LIGHT S/N

☐ OUTPUT > 1000 μ W/cm²☒ AMBIENT < 2 fc

ENETRANT

MINIMUM DWELL TIME

10

MIN.

LIGHTING EQUIP.

☐ FLASHLIGHT☐ TROUBLELIGHT☐ OUTPUT > 100 fc @ SURFACE

ENETRANT REMOVER

MINIMUM DRY TIME

>10

MIN.

OTHER

DEVELOPER

MINIMUM DWELL TIME

10

MIN.

LIGHT METER S/N

CAL DUE DATE

DEVELOPER TYPE

☒ NON AQUEOUS☐ AQUEOUS☐ DRY

TEST SURFACE

SURFACE CONDITION

☐ AS GROUND☐ AS WELDED☐ MACHINED☐ SHOT BLASTED☒ CLEAN BARE METAL

SURFACE TEMPERATURE

☐ < -4°C/20°F☐ -4°C/20°F TO 10°C/50°F☒ 10°C/50°F TO 52°C/125°F☐ > 52°C/125°F

RESULTS-

☐ METRIC ☐ IMPERIAL

1	STUDS (4)	W.O. ID 69625	✓
2	CROSS TUBE	W.O. ID 69667	✓
3	CROSS TUBE	W.O. ID 69470	✓
4	"	W.O. ID 69965	✓
5	"	W.O. ID 71044	✓
6	"	W.O. ID 71045	✓
7	"	W.O. ID 71042	✓
8	"	W.O. ID 69964	✓

ITEM ID	D3688-3	
ITEM ID	69971	AFT
ITEM ID	D206-667-207 BL	AFT
ITEM ID	D206-667-107 BL	FWD
ITEM ID	D206-667-203 BL	AFT
ITEM ID	D206-667-203 BL	AFT
ITEM ID	D206-667-103 BL	FWD
ITEM ID	D206-667-107 BL	FWD

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARDS.

11-07-11

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as presentations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

When performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

TECHNICIAN (SIGNATURE):

NAME (PRINT):

John Titley

JVES DESROSIERS

1ST TECHNICIAN

CGSB LEVEL 2 SNT LEVEL 2

CGSB REG. NO. 3049

Acuren

SIGNATURE

2ND TECHNICIAN

CGSB LEVEL SNT LEVEL

CGSB REG. NO.

DTR # E44696

REPORT

REVIEWED BY:

NAME

INITIALS

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PT Sept 2005